# N° 10,813 A.D. 1888

*Date of Application, 26th July, 1888*
*Complete Specification Left, 24th May, 1889—Accepted, 20th July, 1889*

## PROVISIONAL SPECIFICATION.

## Improvements in and relating to Apparatus for Receiving Payment and Administering Electricity for Medical or other Purposes.

I, William John Woodward, of Judson's & Co. Limited, Ewer Street, Southwark Street, in the County of Surrey, Electrician, do hereby declare the nature of this invention to be as follows:—

My invention relates to apparatus for automatically administering electricity, and more especially to apparatus of that kind or class intended to administer medical electricity to the human frame.

The main object of my invention is to provide an apparatus by means of which upon inserting a coin or coins of the proper value into the said apparatus a primary or secondary current of electricity can be applied to the human body, for medical purposes, the regulation of the strength of said current being entirely under the control of the person operating the apparatus.

My said invention comprises moreover various other improvements hereinafter set forth.

In carrying my said invention into practice I provide an enclosing case or box of suitable dimensions, the front and top thereof being preferably hinged for facilitating access to the interior. Within said case or box is arranged one or more cells of an electric battery, of any suitable type.

Upon one side of the interior of the case or box is attached an induction coil, or in certain cases I may employ a primary coil, suspended upon a suitable pivot so that it may be free to move laterally. Two handles of suitable size and form are attached to the exterior front of the said case or box, one of which is fixed, and the other arranged to allow of its being turned to the right or to the left as may be desired. A double crank, fitted upon the spindle of a movable handle within the case or box allows of the rotation thereof against the tension of a spiral or other spring for the purpose of causing an iron coil, to slide in and out of the coil in order that the strength or intensity of the current of electricity may be regulated according to requirements.

A contact cam is fixed upon the spindle of the movable handle, in such a manner that it makes electrical contact with a metal spring or brush upon a slight rotary movement of the said movable handle and spindle and thereby completes the electrical circuit, the spring or brush being electrically connected to one pole of the battery above mentioned. The opposite pole of said battery is connected through a suitable contact breaker and coil to the movable handle. A metal catch is pivotted to the case, the lower end of this catch engages with a cam piece upon the spindle of said movable handle. A flap attached to, or forming part of the said cam piece closes or partly closes the lower opening of a suitable trough or chute the position of the aperture corresponding with a slit in the lid of the containing case or box. A coin of predetermined weight, size and value, being inserted in said slit, will fall by gravity down the said trough or chute, and strike the pivoted balanced flap which becomes displaced, and thus removes the catch from its engagement with the cam piece. The movable handle may now be turned and electrical contact is thus established between the contact breaker (which is connected to the battery) and the said movable handle.

The secondary wires are also coupled to the two handles respectively, or, in the case of a primary coil, the primary wires are suitably branched to serve the purpose of conveying the current to the handles. The movable handle is locked by the hereinbefore described catch and cam piece until a coin of sufficient weight to balance the said catch is dropped through the orifice or slit in the box or case, and until this operation is performed the electrical contact is not established

[*Price* 8*d*.]

The current strength is, of course, regulated by the amount the iron core is inserted into the coil, this is effected by the double crank before mentioned. An index, fixed to the movable handle indicates the strength or degree of intensity of the current upon a graduated quadrant. This may if necessary be fitted with ratchet teeth so as to secure the handle to any desired strength of current.

I sometimes provide a single lever or arm upon the spindle of the movable handle, the end of this lever or arm is attached to the iron core, in this case the locking arrangement comprising the cam piece catch and flap hereinbefore described are replaced by a flap and catch acting direct upon the lever. The oscillatory movement of the coil upon the pivot allow of the reciprocatory motion of the iron core in both cases, without causing undue friction or straining.

In combination with the above described apparatus, I sometimes moreover provide a floor plate ; or a chair, arranged as a conductor in electrical communication with one pole of the apparatus, or I may apply the poles to a bath, or arrange screws, clips or equivalent devices in connection with flexible conductors for transmitting the induced or primary current to any required distance from the apparatus.

In a modification of my invention I provide one or more cells of an ordinary galvanic battery of any suitable type in conjunction with a coil or helix of wire, which may be either a primary wire for administering a direct intermittent primary current, or, a secondary coil may be wound upon the primary coil, in order to utilize an induced current of higher potential. The battery and coil with an automatic make and break contact of any ordinary type are enclosed in a case of suitable shape and design.

In order to prevent the wasting of the energy of the battery by maintenance of a closed circuit when a current is not required, and further to obviate the liability to probable damage to, and consequent exhaustion of the battery by meddlesome people, I arrange a slide piece preferably rectangular in transverse section of other suitable conducting material. The said slide piece terminates in a handle which serves as one of the conducting poles of the apparatus. The said handle and slide piece upon being drawn out are so arranged as to vary the strength of the current according to the degree to which said handle and slider piece may be drawn out, the current strength being determined by a graduated scale marked upon one of the surfaces of the said rectangular slide piece above described. The said slide piece is moreover arranged to slide freely within horizontal guides and is kept in its normal position by the tension of a suitable spring. The said slide piece may be made to operate either by pushing in or by pulling out against the spring according to the particular apparatus adopted.

A contact block, spring, brush or equivalent makes contact with the said slide piece by means of an arm or pin and completes the primary electrical circuit when the handle is slightly drawn forwards or pressed inwards as the case may be.

At the end of the said slide piece is attached a magnetic core of the coil, so that the power of said coil, whether used as a primary or induction coil, may be regulated by the proportion of the core inserted within or withdrawn from the helices.

Upon, or in combination with the slide piece hereinbefore referred to, is pivoted or hinged a pawl, catch or equivalent device, which lock the said slide piece in its normal position between the guides, and by means of a key or equivalent device the said pawl may be removed from its locking position, thus enabling the slide piece to be drawn out or pushed in as the case may be and the apparatus brought into action. This arrrangement limits the use of the apparatus to those in possession of the key, and thus prevents any irregular tampering with the said apparatus.

In some instances I provide for unlocking the mechanism by counterbalancing the hereinbefore mentioned pawl by attaching thereto a flap or shield. The said flap or shield may moreover form part of the pawl and is intended for the purpose of closing or partially closing a shoot or channel arranged in such a manner that upon the dropping therein through a suitable slot in the lid or cover of the case or box a coin of the proper size and weight the said coin falls upon and bears down the said flap or shield sufficiently to allow of the said pawl disengaging from the catch upon the slide piece and thus allowing of the withdrawal or pressing in of said slide pieces. In the act of withdrawal the slide the said catch bears upon the curved part of said pawl and raises it to a greater extent, by which the coin is released and falls into a receptacle provided for the purpose in the bottom of the box.

Although I have hereinbefore described convenient and advantageous methods of carrying my said invention into practice, it is obvious that I can somewhat further modify the construction of my apparatus without however in any way departing from the nature of my said invention. For instance, instead of employing the slide piece hereinbefore described for closing the electrical circuit I sometimes substitute therefor a pivoted lever having at its pivoted end a cranked extension or branch arm perforated at its extremity with an elongated slot. The said cranked extension engages with the forked end of the magnetic regulating core, the arc described by the said crank upon the pulling forward of the lever is compensated for by means of the said elongated slot.

Dated this 25th day of July 1888.

HASELTINE, LAKE & Co.,
45, Southampton Buildings, London, W.C., Agents for the Applicant.

## COMPLETE SPECIFICATION.

## Improvements in and relating to Apparatus for Receiving Payment and Administering Electricity for Medical or other Purposes.

I William John Woodward, Messieurs Judson & Co., Limited, Ewer Street, Southwark Street, in the County of Surrey, Electrician, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

My invention relates to apparatus whereby the administration of electricity to the body for medical or other purposes may be effected upon the insertion of a coin or coins into the said apparatus.

The main object of my invention is to provide an apparatus of this kind or class which is so constructed that the person using it may, at pleasure vary the strength of the current received, and the strength of the current will be indicated by the motion of an index needle or otherwise as hereinafter described, so that a person may know the exact strength of current passing and may on two or more separate occasions, adjust the apparatus so that he will receive currents of the same strength.

Provision is, moreover, made in my improved apparatus for automatically breaking the circuit of the exciting primary battery which is employed for generating the electricity thereby greatly economising the energy of the said battery and increasing largely its period of usefulness.

In the accompanying drawing I have shown how my said invention may be conveniently and advantageously carried into practice.

Figures 1, 3 and 7 are vertical longitudinal sections showing different forms or modifications of my improved apparatus.

Figure 2 is a transverse section on the line $y$, $y$ Figure 1.

Figures 4, 5 and 6 are views illustrating details of construction and modifications of my invention hereinafter referred to.

Figure 8 is a transverse section on the line $z$, $z$, Figure 7.

Like letters indicate corresponding parts throughout the drawing.

A is the box or case of the apparatus. One or more cells B of a galvanic battery of any suitable type are arranged in the said box or case in conjunction with a wire coil or helix C of the class usually termed "shock" coils, "intensity" coils or "induction" coils which may be such as to administer either an intermittent primary current, or an induced current of high potential. The battery B and coil C with an automatic circuit interruptor D of any suitable type are enclosed in the case A which may be of any convenient form and design, and the top and side or end of which are preferably hinged to allow of their being easily opened for inspection and for other purposes.

To prevent waste of the energy of the battery by the maintenance of a closed circuit when a current is not required, and further to obviate the liability to probable injury to the apparatus by meddlesome persons, I arrange a contact piece F or equivalent device to make contact with an arm or pin *b* carried on a slide-bar E preferably rectangular in transverse section and constructed of brass or other suitable conducting material. In the operation of the apparatus, when, but not until, the slide-bar E is drawn outward the pin or arm *b* thereon comes in contact with the piece F and so completes the battery circuit. The said slide-bar terminates in a handle *e* which serves as one of the conducting poles or terminals of the apparatus.

To the other end of the said slide-bar E is attached a core M of magnetic material and of such shape that it can be easily inserted into the coil C so that the power of the said coil, may be regulated by varying the extent to which the core is inserted within the same. A graduated scale *d* is marked on the slide-bar E as shown in Figure 4 for the purpose of indicating the extent to which the same has been withdrawn.

In combination with the slide-bar E is arranged a pivoted pawl or catch G or equivalent device, more clearly shown in Figure 5, which engages with a projection *f* on the said slide-bar E when the latter is in its normal position and so arranged that by means of a key or in any other suitable manner, the said pawl may be removed from its locking position, thus enabling the slide-bar to be drawn out, and the apparatus brought into action. This arrangement limits the use of the apparatus to those in possession of the key, and thus prevents any irregular tampering with the said apparatus.

I prefer however to provide for unlocking the mechanism by attaching a flap or shield *c* to the pawl G. The said flap or shield *c* may, if desired, form part of the pawl G and is intended for the purpose of closing or partially closing a chute or channel H arranged in such a manner that upon dropping therein, through a suitable slot *k* in the lid or cover of the case A, a coin of the proper predetermined size and weight the said coin will fall upon and bear down the said flap or shield *c* sufficiently to cause the disengagement of the said pawl G from the projection or shoulder *f* upon the slide-bar E, thus permitting the drawing outward of the said slide-bar. In the drawing outward of the slide-bar E the said projection or shoulder *f* acts upon the curved under surface of the pawl G thus raising it to a greater extent, so that the coin is released and falls into a receptacle provided for the purpose in the bottom of the box.

The mode of operating the apparatus and the course followed by the current are as follows *viz.*:—The slide-bar E having been unlocked by the raising of the pawl G either by a key or by a coin inserted in the chute H, is slowly pulled outward; in this movement, the primary circuit is closed by contact of the pin *b* with the spring F, the current flowing say from the battery terminal Z through the coil of the vibrating contact device D and thence from the pillar *x* to the spring or contact-piece F and through this spring to the arm or pin *b*, and through the primary wire of the helix or coil C to the other terminal $c^1$ of the battery. One end of the secondary coil is connected to the slide-bar E and the induced current flows thence by way of the handle *e* through the body of the person holding the same to the other handle $D^1$ to which is attached the other end of the secondary coil, thus completing the secondary circuit.

I have hereinbefore described more particularly my improvements in relation to apparatus in which the coils or helices C are arranged to deliver an induced or secondary current of high potential. Other suitable coils may however be employed as for instance those which yield an intermittent primary current the only modification of the apparatus hereinbefore described being that the connections must be suitably altered so that the current from the said coils may be conveyed to the handles *e*, $D^1$ in the same manner as in the construction above described.

In some instances, instead of employing the slide-bar hereinbefore described for closing the electrical circuit and moving or adjusting the magnetic core, I provide a lever Figures 3 and 6 the short arm J of which is formed with an elongated slot *j*.

The said arm J is coupled by means of a pin *h* working in the said slot, with the forked end of the magnetic core M.

The said lever E is provided with a contact-pin or stud *b* arranged to operate in conjunction with a contact-piece F, Figure 6, in a similar manner to the parts *b* and F in Figures 1 and 2. A catch and flap, not shown in the drawing, similar to those shown in Figures 1 and 5 are provided for locking and liberating the said lever and an index is arranged to show the number of degrees through which the lever E is moved.

A further modification of my improved apparatus is shown in Figures 7, 8, 9 and 10, in which the rod E passes transversely through the case A and is supported by suitable bearings or pivots in or attached to the sides of the said case so as to be easily rotated about its axis by the handle *e* provided at one end thereof, instead of being arranged to slide in and out. An arm J coupled at its extremity to the core M of the coil C is fixed on the said rod E and turns therewith. In this case the coil or helix C is not rigidly fixed but is constructed to swivel on a pivot *p* so as to accommodate itself to the motion of the core when the latter is being inserted into or withdrawn from the said coil by the rotation of the bar E. The action of the catch G and of the flap *c* attached thereto is analogous to that of the same parts in Figures 1 and 5. The graduated scale $p^1$ and the needle $e^1$ shown in Figure 10 indicate the amount of angular movement of the rod E and consequently the degree to which the core is inserted in the helix. The operation of the remaining parts of the mechanism are the same as those of their counterparts in the other Figures of the drawing and the operation of the apparatus and course of the current therein, are substantially the same. I can also by transposing the position of the parts shown in Figure 1 arrange to insert the core M by pushing in the handle *e* instead of by withdrawing it, such arrangement being obvious and requiring no detailed description.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed I wish it understood that I do not claim generally or irrespectively of my improvements herein described the use, in an apparatus for the administration of electricity, of a slide-bar or the like which will be released when a coin is inserted in the apparatus, nor do I claim generally the use of an induction coil the core of which is connected with the slide-bar or operating handle ; but I claim :—

First. The combination, with an induction or other coil, an electric battery and a circuit interruptor, of the improved means hereinbefore described whereby the release of the operating handle, slide-bar or lever will be effected by the weight of a coin inserted in the apparatus, as and for the purpose, above specified.

Second. The combination, in an apparatus for the administration of electricity to the human frame, of an induction coil C, a slide-bar or lever attached to the core of the said induction-coil and provided with a contact pin or stud *b*, a circuit interruptor D. and a contact piece F, substantially as, and for the purposes, set forth.

Third. The improved apparatus constructed substantially as described with reference to either of the forms or modifications shown in the accompanying drawing and operating as, and for the purpose, above specified.

Dated this 24th day of May 1889.

HASELTINE, LAKE & Co.,
45, Southampton Buildings, London, Agents for the Applicant.

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Fig. 1.

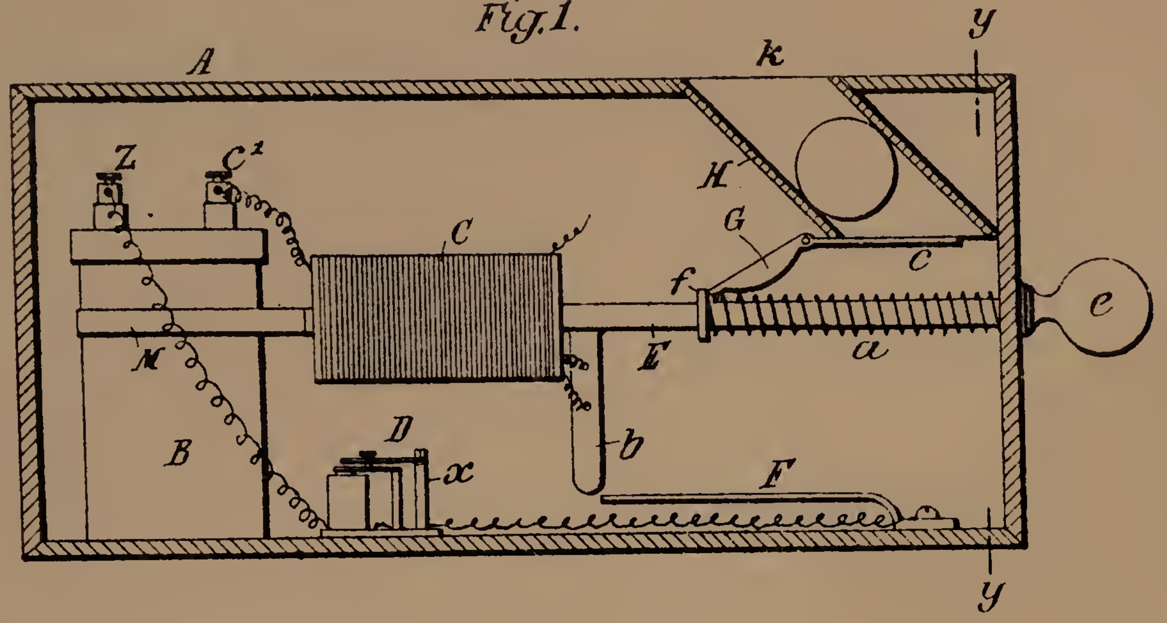


Fig. 2.

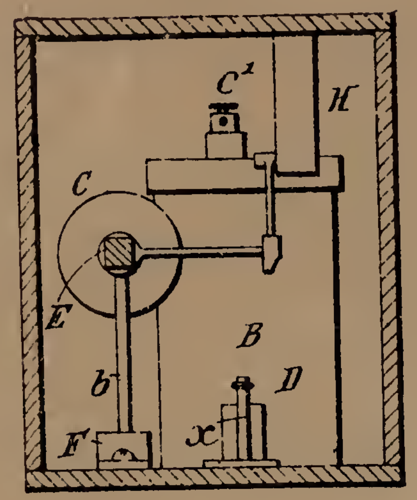


Fig. 3.

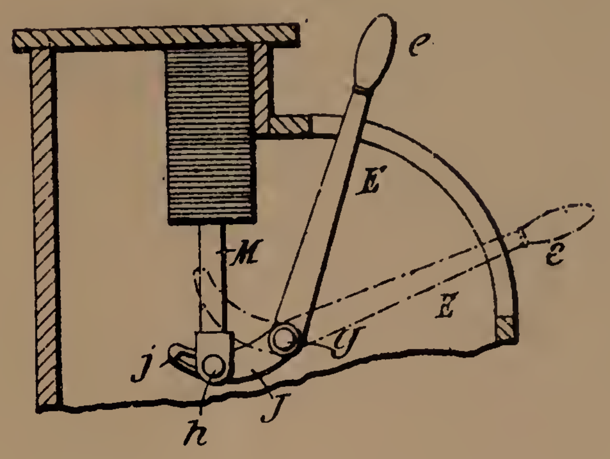


Fig. 4.

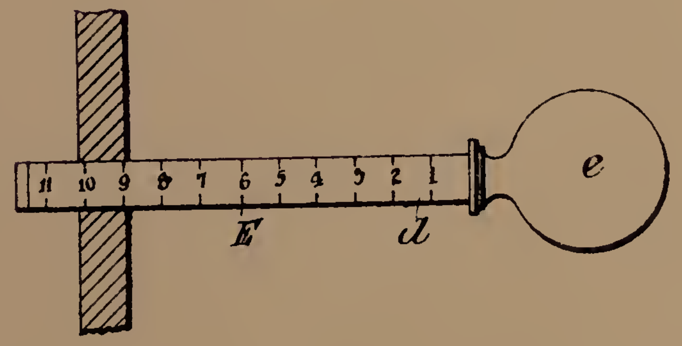


Fig. 5.

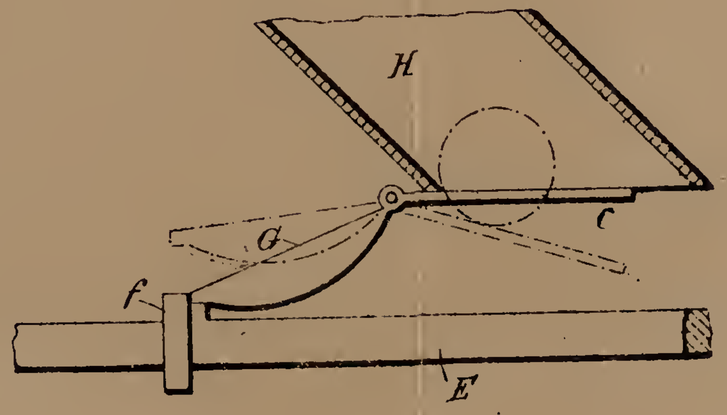


Fig. 6.

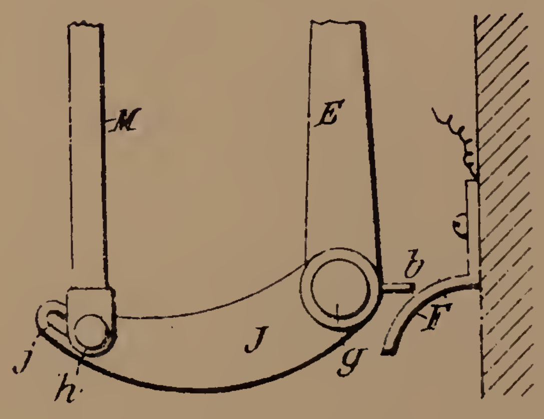


Fig. 7.

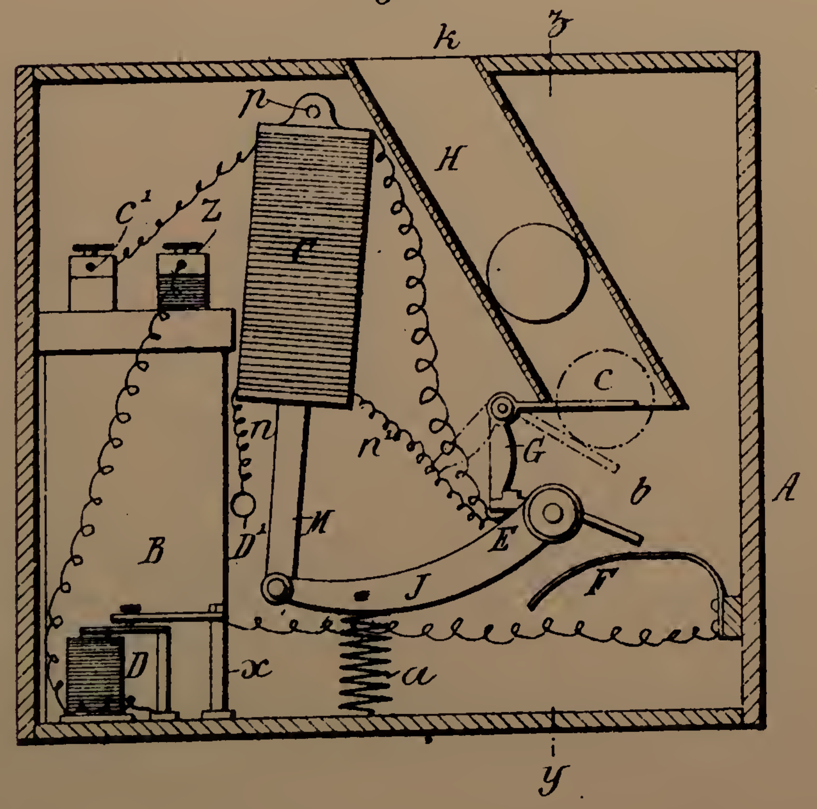


Fig. 8.

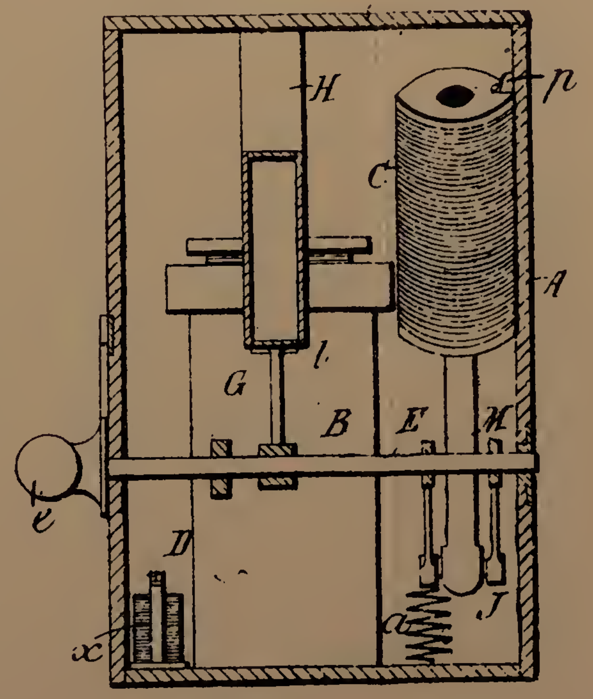


Fig. 9.

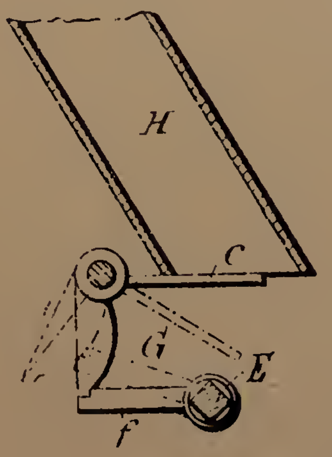
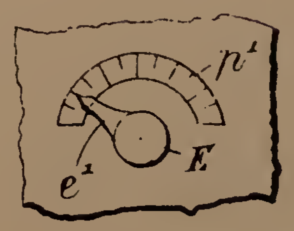


Fig. 10.



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